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Commissioner for PatentsApplication No.10/734,213**REMARKS/ARGUMENTS**

The present Response is responsive to the Office Action mailed April 18, 2007. Claims 1-6, 8, 11, 12, 15-24 are pending in the application.

Rejection 35 U.S.C. § 112 – First paragraph

Claims 1-6, 8, 11, 12, 15, 16, and 17 are rejected under 35 U.S.C. § 112, first paragraph. Applicant respectfully disagrees that there is no support in the specification for the limitation “no extrusion of the stump portion occurs during said forging” or “forging a substantially extrusion-free stump portion on the blank”.

Support can be found in paragraph [0017]:

“...similar extrusion forging would be subject to the presence of regions of weakness that would not be able to bear the induced internal stresses during operation.”

Paragraph [0020]

“Extrusion of stump 30 is preferably minimized or, more preferably avoided altogether, to thereby avoid introducing unacceptable internal regions of weakness, as will be described in more detail below.”

Paragraph [0021]

“Preferably extrusion is minimized, for example, by forging the part from a billet having a selected diameter relative to the diameter of the stump portion, the billet diameter being selected to minimize or prevent extrusion of the stump portion.”

Paragraph [0021]

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"In another approach, the stump portion dimension, and in particular diameter and height, are selected so as to minimise, and more preferably negate, the occurrence of extrusion in forming the stump portion."

Paragraph [0026]

"Therefore, the present solution avoids these shortcomings of the prior art by optimizing the amount of work done in forging, and preferably ensuring that extrusion does not occur."

The rejection is overcome and claims 1-6, 8, 11, 12, 15, 16, and 17 comply with the written description requirement.

Rejection 35 U.S.C. § 112 - Second paragraph

Claim 8 is rejected under 35 U.S.C. § 112, second paragraph. Applicant respectfully disagrees that the phrase "butt-like" renders the claim indefinite because it is not disclosed.

Claim 8 is amended and the phrase or expression "butt-like" has been removed.

The rejection is overcome and claim 8 is definite.

Rejection 35 U.S.C. § 103(a)

Claims 1-6, 8, 11-12, and 15-24 were rejected under 35 U.S.C. § 103(a) as being unpatentable over FR patent application No. 2,739,658 to Broust (hereinafter "*Broust*") in view of Applicant's Admitted Prior Art (hereinafter "*AAPA*").

The Applicant respectfully disagrees with the Office Action stating: "Broust teaches a gas turbine compressor having a stump portion, with the axis of rotation the stump portion extending from the back face and a metal stub shaft by friction welding..."

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Broust teaches a method to provide a bimetallic turbine shaft 1 from two iron alloys components welded together. As shown in Fig. 2 of Broust, reproduced below, the first component is a shaft 10 (or leg) that is welded to a the second component, a flange portion 11, at an interface 16. The flange portion 11 has an integral flange 14, with bolt holes 15, for providing a bolted connection to a low pressure turbine disc 3 (Broust: page 2, lines 24-23).

The Applicant respectfully disagrees with the Office Action stating: "... the height is selected to optimize the mechanical work done on the body while minimizing extrusion in the region...". Broust is silent about how the components are made, including extrusion. As detailed in the Inventor's declaration included herewith, the size and relative dimensions of the flange portion 11 indicate that the portion generally indicated "12" is formed by extrusion during the forging of flange portion 11.

Furthermore, the flange 14 is neither an impeller with a stump portion, nor an impeller blank with a stump portion. The flange 14 is a small component, relatively to an impeller, to which the turbine 3 is fastened. It is not an aerodynamic component adapted to be driven by a fluid flow and is not considered a "critical" rotating part by airworthiness authorities. Nothing in Broust suggests the applicability of the method taught beyond shafts.

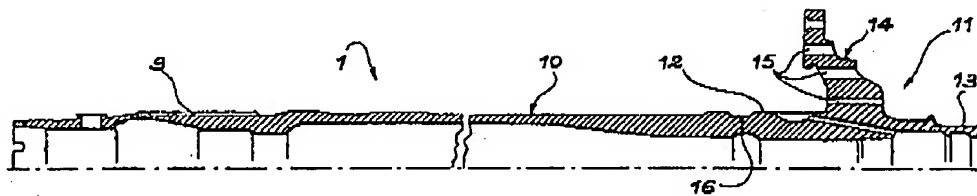


Figure 2 of Broust

As stated in the Inventor's declaration, AAPA discloses an integral shaft impeller (FIG. 2 b) provided by extruding a stub shaft SS during forging. However, this conventional manufacturing technique cannot be applied for IMI 834 gas turbine compressors. One skilled in the art would expect poor mechanical performance, such as poor long cycle fatigue life, for components of that size with this particular alloy. The resulting compressors would not meet the industry required standards.

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The prior art, including Broust and AAPA, discloses no advantage to minimizing or eliminating extrusion.

Independent claims 1, 8 and 18 are directed to a novel manufacturing technique for making an impeller with IMI834 having mechanical properties meeting the industry required standards. As stated in the Inventor's declaration, by forging the stump portion, instead of extruding it, it was surprisingly noted that a sufficient amount of work is achieved to provide good mechanical properties while, at the same time, reducing the introduction of the unacceptable internal regions of weakness, which occurs with extrusion.

The Applicant respectfully disagrees with the statement "...AAPA teaches forging and no additional or subsequent processes of the compressor part. This suggest that no additional or subsequent processes occur (including extrusion) during or after the forging step" in the Response to Arguments section of the Office Action dated April 18, 2007. Compressors are formed by forging, heating treating, and then machining. For mounting a shaft to the compressor, four techniques have been applied: (a) connecting a flanged shaft with bolts; (b) keyed shafts; (c) friction fits; and (d) connecting a threaded shaft to an extruded stub shaft.

As mentioned in the Inventor's declaration, for the first three techniques, the shaft is directly mounted to the compressor. Therefore, it does not include stump portion which is used for IMI 834 and friction welding techniques. For the last technique, the stub shaft is extruded. This is not applicable for IMI 834 since the resulting compressor would have inadequate mechanical properties. In the manufacturing technique of claims 1, 8 and 18, a stump portion is provided by forging, thereby minimizing extrusion.

In view of the foregoing, withdrawal of the rejection of claims 1-6, 8, 11-12, and 15-24 is respectfully requested.

#### Conclusion

The application is believed in condition for allowance. Reconsideration of the objections is respectfully requested. In the event that there are any questions concerning this amendment or the

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application in general, the Examiner is respectfully urged to telephone the undersigned so that prosecution of this application may be expedited.

It is not believed that extensions of time or fees for addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 C.F.R. § 1.136(a), and any fee required therefore (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 19-5113.

Respectfully submitted,

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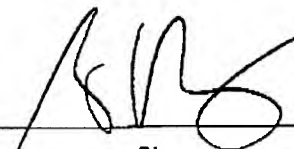
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Name of person signing certification

October 17, 2007

  
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